

REMARKS

Status of this application

Claims 1-41 and 43-44 are pending.

In the Office Action mailed on August 10, 2006, claims 43 and 44 were objected to as being out of order and it was noted that claim 42 was missing and hence would be treated as a canceled claim. Claim 37 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1, 2, 6, 8, 9, 14-19, 24-36, 43 and 44 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,384,487 to Browning (hereafter "Browning"). Claims 3-5, 7, 20-23 and 39-41 were rejected under 35 U.S.C. 103(a) as being directed to subject matter deemed to be obvious in view of Browning. Claims 39-41 were rejected under 35 U.S.C. 103(a) as being unpatentable over Browning in view of U.S. Patent No. 3,965,753 to Browning Jr. (hereafter "Browning '753").

Claims 10-13 and 38 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form. This response amends claims 10 and 38 to place them in independent form. Dependent claims 14-37 and 43-44 have also been made dependent on allowed claim 10, and dependent claims 39-41 of been made dependent on allowed claim 38. Accordingly, claims 10-41 and 43-44 are now believed to be in condition for allowance.

This response amends independent claim 1 to more clearly set forth applicants' invention, and claims 2, 3, and 6-9 are dependent on claim 1. Claims 4-5 have been canceled. The allowability of claims 1-3 and 6-9 is discussed in more detail below.

The objection to claims 43 and 44

Claims 43 and 44 were objected to as being out of order and it was noted that claim 42 was missing and hence would be treated as a canceled claim. As reflected in the foregoing "Amendment to the claims" section, this response has reordered claims 43 and 44, placing them after claim 41, and indicating that claim 42, which was missing in the application as submitted, is "canceled" as suggested by the Examiner.

The rejection of claim 37 as being indefinite

Claim 37 has been amended by this response to create a proper antecedent for the limitation "the orientation of the asymmetrical orbit."

The allowability of claims 1-3 and 6-9

The Examiner's attention is directed to the disclosure in U.S. Patent 3,065,640 issued to D.B. Langmuir et al., and particularly to Fig.8 and to col. 14, lines 3-68 of that patent which describes the use of an electrodynamic trap in an accelerometer to locate a charged dust particle 60 at an equilibrium position, and discusses how the amount of electrodynamic force required to hold the particle at an equilibrium position against gravity or acceleration forces can be used to measure the gravitational or acceleration forces. The Langmuir patent was discovered by one of the applicants during the preparation of this response and is being made of record by the accompanying Information Disclosure Statement.

As explained at pages 2 and 3 of applicants' specification, a conventional accelerometer can be most simply described as a mass on a spring, at equilibrium with the local acceleration field, combined with some means to read out the equilibrium position and thereby infer the applied acceleration. In applicants' invention, a trapped particle acts like a mass on a spring, but the restoring forces are provided by electrodynamics. The present invention constrains the charged particle to a specific location between electrodes by a substantially linear, tunable restoring force, and measures the position or motion of the particles as inertial forces move the particles with respect to this restoring force. To create this substantially linear and tunable restoring force, applicant's invention uses an electrodynamic trap of the kind known as a "Paul trap" which employs a ring electrode and one or more other electrodes that are axially aligned and spaced from the plane of the electrode ring. An oscillatory potential applied between the ring electrode and the other electrode creates a quadrupole field that applies the substantially linear restoring force to the charged particle(s).

In contrast, Browning measures the motion of a test mass (particle) in free fall. Browning periodically applies voltages to nearby electrodes to position the particle in a containment area, but these positioning voltages are turned off to place the particle in a free fall state when the readings are made. Browning's electrodes are not energized when the particle's motion is measured during its free fall conditions, and are only energized to return the particle to

the proper position in the containment area before the next free fall measurement phase begins.

The accelerometer describe Langmuir Patent 3,065,640 employs an electrodynamic trap that is continuously energized by a three-phase oscillating potential with each phase being applied across the two opposing square faces of a containment cube. In order to achieve a linear, tunable force applied to the charged particle(s), applicant employs a "Paul trap" configuration comprising an ring electrode and at least one other electrode positioned radially outward from the ring electrode as now set forth in claim 1. Neither Browning nor Langmuir disclose the use of this electrode configuration as now set forth in amended claim 2 and its dependent claims 2-3 and 7-9 to apply a substantially linear force to the particle(s) and a readout device fore measuring the position or motion of the particle(s) when subjected to these applied and electrodynamic forces.

Conclusion

Claims 10-41 and 43-44 have either been indicated to be allowable, or have been made dependent upon claims indicated to be allowable. Claims 1-3 and 6-9 have been substantially amended to set forth subject matter which is neither disclosed nor suggested in the art of record. Allowance of calims 1-3, 7-41 and 43-44 is accordingly requested.

Respectfully submitted,



Dated: February 12, 2006

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Certificate of Transmission under 37 CFR 1.8

I hereby certify that this *Amendment* is being transmitted by facsimile to the central facsimile number of the U.S. Patent and Trademark Office, (703) 872-9306, on February 12, 2007.



Dated: February 12, 2007

Signature _____

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